

(FILE 'HOME' ENTERED AT 16:23:08 ON 10 OCT 2003)

FILE 'REGISTRY' ENTERED AT 16:23:18 ON 10 OCT 2003

L1	1 S DIFLUOROMETHANE/CN
L2	1 S DICHLOROMETHANE/CN
L3	1 S HYDROGEN FLUORIDE/CN

FILE 'CAPLUS, USPATFULL' ENTERED AT 16:24:32 ON 10 OCT 2003

L4	499 S L1 AND L2
L5	127 S L4 AND L3
L6	47 S L5 AND CHROMI?
L7	17 S L5 AND CHROMIUM OXIDE
L8	3 S L7 AND HYDROFLUORINATION
L9	0 S L1 (P) L2 (P) L3
L10	2 S L1 (P) L2
L11	14 S L7 NOT L8
L12	14 S L11 NOT L10
L13	13 DUP REM L12 (1 DUPLICATE REMOVED)
L14	13 S L13 AND CATALYST
L15	11 S L14 AND HYDROGEN FLUORIDE

L15 ANSWER 1 OF 11 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 2002:23840 CAPLUS  
 DN 136:71542  
 TI Fluorination **catalyst** and process for fluorinating halogenated hydrocarbons  
 IN Shibamura, Takashi; Iwai, Yoshio; Koyama, Satoshi  
 PA Daikin Industries Ltd., Japan  
 SO U.S., 8 pp., Cont.-in-part of U.S. Ser. No. 886,822, abandoned.  
 CODEN: USXXAM  
 DT Patent  
 LA English  
 FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 6337299	B1	20020108	US 1993-52684	19930427
	US 5849658	A	19981215	US 1995-435166	19950505
	US 6300531	B1	20011009	US 1995-435178	19950505
PRAI	JP 1991-120132	A	19910524		
	US 1992-886822	B2	19920522		
	US 1993-52684	A1	19930427		

AB The **catalyst** comprises **chromium oxide** having a sp. surface area of 170-300 m<sup>2</sup>/g. The **catalyst** can catalyze the fluorination of halogenated hydrocarbons (e.g., 1,1,1-trifluorochloroethane) with HF and has a high activity and a long **catalyst** life.

RE.CNT 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L15 ANSWER 2 OF 11 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1997:496566 CAPLUS  
 DN 127:96813  
 TI Shaped heterogeneous fluorination **catalysts** and manufacture of halogenated hydrocabons with high catalytic activity, low pressure loss, and long **catalyst** life  
 IN Kanemura, Takashi; Kono, Satoshi; Kitano, Keisuke; Takahashi, Kazuhiro; Shibamura, Shun  
 PA Daikin Industries, Ltd., Japan  
 SO Jpn. Kokai Tokkyo Koho, 8 pp.  
 CODEN: JKXXAF  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09141105	A2	19970603	JP 1995-329853	19951124
PRAI	JP 1995-329853		19951124		

AB The (un)supported title **catalysts** based mainly on Cr, Cr oxide, Cr fluoride, and/or Cr oxyfluoride are hollow cylindrical with outer diam. 2-20 mm, inner/outer diam. ratio 0.1-0.7, and length 0.2-2.0 times the outer diam. Cr hydroxide from Cr nitrate and ammonium hydroxide was mixed with 3% graphite, compression molded (outer diam. 5 mm, inner diam. 2 mm, length 5 mm) and treated with HF-N at 200-360.degree. for 2 h and used as **catalyst** for reaction of HCFC-133a with HF with HFC-134a yield 12.3%.

L15 ANSWER 3 OF 11 CAPLUS COPYRIGHT 2003 ACS on STN  
 AN 1995:589470 CAPLUS  
 DN 122:323362  
 TI Chromium-based fluorination **catalyst** for manufacture of hydrofluorocarbons from halogenated hydrocarbons  
 IN Tsuji, Katsuyuki; Nakaji, Tetsuo  
 PA Showa Denko K. K., Japan  
 SO Eur. Pat. Appl., 17 pp.

CODEN: EPXXDW

DT Patent  
LA English  
FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 641598	A2	19950308	EP 1994-113719	19940901
	EP 641598	A3	19950531		
	EP 641598	B1	19990107		
	R: BE, DE, ES, FR, GB, GR, IT, NL, PT				
	CA 2131361	AA	19950308	CA 1994-2131361	19940901
	JP 08038904	A2	19960213	JP 1994-212812	19940906
	JP 2996598	B2	20000111		
	CN 1105951	A	19950802	CN 1994-115127	19940907
	CN 1087189	B	20020710		
PRAI	JP 1993-222633	A	19930907		
	JP 1994-130850	A	19940523		

AB The **catalyst** is prepd. by firing a substance contg. Cr(OH)<sub>3</sub> in the presence of H at a temp. of 350-500.degree. or by heat-treating the Cr(OH)<sub>3</sub> in an inert gas stream at a temp. of 100-600.degree. and then firing the heat-treated compd. in the presence of H at the above temp. to grow cryst. Cr<sub>2</sub>O<sub>3</sub>. The **catalyst** is then fluorinated with HF at 300-500.degree.. Halogenated C1-4 hydrocarbon are brought into contact with gaseous HF in the presence the **catalyst** to produce hydrofluorocarbons (HFC) and hydrochlorofluorocarbon (HCFC). High yields of HFC's and HCFC's are obtained at relatively low temps.

L15 ANSWER 4 OF 11 CAPLUS COPYRIGHT 2003 ACS on STN  
AN 1995:453483 CAPLUS  
DN 122:293893  
TI Manufacture of difluoromethane from dichloromethane  
IN Tanaka, Kunitada; Shibnuma, Takashi  
PA Daikin Ind Ltd, Japan  
SO Jpn. Kokai Tokkyo Koho, 5 pp.  
CODEN: JKXXAF

DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 07017882	A2	19950120	JP 1993-191942	19930705
PRAI	JP 1993-191942		19930705		

AB CH<sub>2</sub>F<sub>2</sub> (I) is manufd. by reaction of CH<sub>2</sub>Cl<sub>2</sub> (II) with HF in liq. phase in the presence of SbCl<sub>x</sub>F<sub>y</sub> (x + y = 5; y = 1-3) **catalysts** and treating the resulted CH<sub>2</sub>FCl (III) with **catalysts** in liq. or gas phases or treating with HF in the presence of **catalysts** in gas phases. Thus, II was treated with HF in the presence of SbCl<sub>2</sub>F<sub>3</sub> (prepd. from SbCl<sub>5</sub> and HF) at 80.degree. under 10 kG pressure. I and HCl followed by HF were removed from the product, and the residual III was passed through Cr oxide at 150.degree. and 80 mL/min to give 35.6 mL/min I.

L15 ANSWER 5 OF 11 CAPLUS COPYRIGHT 2003 ACS on STN  
AN 1994:680250 CAPLUS  
DN 121:280250  
TI Preparation of difluoromethane  
IN Bonniface, David William; Scott, John David; Watson, Michael John  
PA Imperial Chemical Industries PLC, UK  
SO PCT Int. Appl., 15 pp.  
CODEN: PIXXD2

DT Patent  
LA English  
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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PI WO 9421579 A1 19940929 WO 1994-GB497 19940314  
W: AU, BR, CA, CN, FI, JP, KR, NO, RU, UA, US  
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE  
CA 2157528 AA 19940929 CA 1994-2157528 19940314  
CA 2157878 AA 19940929 CA 1994-2157878 19940314  
AU 9462133 A1 19941011 AU 1994-62133 19940314  
AU 691486 B2 19980521  
BR 9406236 A 19960109 BR 1994-6236 19940314  
EP 690832 A1 19960110 EP 1994-909203 19940314  
EP 690832 B1 19980520  
R: BE, DE, ES, FR, GB, IE, IT, LU, NL, PT  
CN 1119431 A 19960327 CN 1994-191525 19940314  
CN 1057750 B 20001025  
CN 1119432 A 19960327 CN 1994-191526 19940314  
CN 1044227 B 19990721  
JP 08508028 T2 19960827 JP 1994-520763 19940314  
ES 2115940 T3 19980701 ES 1994-909203 19940314  
ES 2116586 T3 19980716 ES 1994-909204 19940314  
RU 2116288 C1 19980727 RU 1995-118158 19940314  
RU 2127246 C1 19990310 RU 1995-121816 19940314  
ZA 9401818 A 19940926 ZA 1994-1818 19940315  
ZA 9401826 A 19940926 ZA 1994-1826 19940315  
US 5672786 A 19970930 US 1995-507429 19950906  
PRAI GB 1993-6072 A 19930324  
GB 1993-6089 A 19930324  
WO 1994-GB497 W 19940314

OS CASREACT 121:280250

AB CH<sub>2</sub>F<sub>2</sub> was prepd. by (a) contacting CH<sub>2</sub>Cl<sub>2</sub> with HF in the presence of a fluorination **catalyst** to produce a product stream comprising CH<sub>2</sub>F<sub>2</sub>, CH<sub>2</sub>ClF, and unreacted starting materials and (b) sepg. CH<sub>2</sub>F<sub>2</sub> from the product stream from step (a); sufficient HF is employed in the process such that during step (b) the molar ratio of HF to CH<sub>2</sub>ClF is .gtoreq.100:1. The high ratio of HF to CH<sub>2</sub>ClF mitigates toxicity problems assocd. with the latter compd. Thus, a tube reactor contg. Zn/Cr oxide **catalyst** was pretreated with HF at 300.degree. for 24 h; the reactor was cooled to 250.degree., pressurized with 10 bar N, and a 27.1:1 molar ratio of HF:CH<sub>2</sub>Cl<sub>2</sub> was introduced. The product stream was scrubbed with water to remove HF and HCl leaving a mixt. of CH<sub>2</sub>Cl<sub>2</sub> 1.0, CH<sub>2</sub>ClF 7.1, and CH<sub>2</sub>F<sub>2</sub> 92.0 vol. %.

L15 ANSWER 6 OF 11 CAPLUS COPYRIGHT 2003 ACS on STN

AN 1982:491669 CAPLUS

DN 97:91669

TI **Catalyst** for fluorination of organic chlorocompounds

AU Marangoni, Luigi; Rasia, Giorgio; Gervasutti, Claudio; Colombo, Luigi

CS Div. Prodotti, Montedison S.p.A., Venice, Italy

SO Chimica e l'Industria (Milan, Italy) (1982), 64(3), 135-40

CODEN: CINMAB; ISSN: 0009-4315

DT Journal

LA English

AB Cr(OH)<sub>3</sub> free of ionic impurities [from NH<sub>4</sub>OH pptn. of dil. KCr(SO<sub>4</sub>)<sub>2</sub>.cntdot.12H<sub>2</sub>O] was dried and calcined at 450-550.degree. to give a long lived fluorination **catalyst**. The gaseous fluorination of CCl<sub>4</sub>, CHCl<sub>3</sub>, CH<sub>2</sub>Cl<sub>2</sub>, C<sub>2</sub>Cl<sub>6</sub>, C<sub>2</sub>HCl<sub>5</sub>, ClCH:CCl<sub>2</sub>, C<sub>2</sub>Cl<sub>4</sub>, C<sub>2</sub>Cl<sub>3</sub>F<sub>3</sub>, C<sub>2</sub>Cl<sub>2</sub>F<sub>4</sub>, (CCl<sub>3</sub>)<sub>2</sub>CO, and CF<sub>3</sub>CH<sub>2</sub>Cl with HF over the **catalyst** is described.

L15 ANSWER 7 OF 11 USPATFULL on STN

AN 2002:69975 USPATFULL

TI Process for the production of difluoromethane

IN Clemmer, Paul Gene, Williamsville, NY, United States

Smith, Addison Miles, Amherst, NY, United States

Tung, Hsueh Sung, Getzville, NY, United States

Bass, John Stephen, East Amherst, NY, United States

PA AlliedSignal Inc., Morristown, NJ, United States (U.S. corporation)

PI US 6365580 B1 20020402  
AI US 1999-425150 19991021 (9)  
RLI Division of Ser. No. US 1997-959748, filed on 28 Oct 1997 Division of  
Ser. No. US 1995-530649, filed on 20 Sep 1995, now patented, Pat. No. US  
5763708  
DT Utility  
FS GRANTED  
EXNAM Primary Examiner: Pryor, Alton  
LREP Szuch, Colleen D.  
CLMN Number of Claims: 12  
ECL Exemplary Claim: 1  
DRWN 0 Drawing Figure(s); 0 Drawing Page(s)  
LN.CNT 338  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
AB The present invention provides a vapor phase process for the production  
of difluoromethane, HFC-32. The process of this invention provides for  
the preparation of HFC-32 by a process that exhibits both good product  
yield and selectivity.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L15 ANSWER 8 OF 11 USPATFULL on STN  
AN 1999:117737 USPATFULL  
TI Method for concurrently producing different hydrofluoro carbons  
IN Kim, Hoon Sik, Seoul, Korea, Republic of  
Chung, Moon Jo, Seoul, Korea, Republic of  
Park, Kun You, Seoul, Korea, Republic of  
Kwon, Young Soo, Seoul, Korea, Republic of  
PA Korea Institute of Science and Technology, Seoul, Korea, Republic of  
(non-U.S. corporation)  
PI US 5959166 19990928  
AI US 1997-966093 19971107 (8)  
RLI Continuation of Ser. No. US 1995-496498, filed on 29 Jun 1995, now  
abandoned  
PRAI KR 1994-15934 19940704  
DT Utility  
FS Granted  
EXNAM Primary Examiner: Siegel, Alan  
LREP Darby & Darby  
CLMN Number of Claims: 24  
ECL Exemplary Claim: 1  
DRWN No Drawings  
LN.CNT 690  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
AB A method for concurrently producing different hydrofluoro carbons,  
comprising the reaction of halocarbon or hydrohalocarbon with  
**hydrogen fluoride** in a reaction system consisting of a  
series of at least two discrete reactors, in the presence of  
**catalysts**, said reactors each being provided with different  
reactant materials and differing in reaction conditions including the  
**catalysts** and/or reaction temperature, thereby flexibly  
controlling their production rates in accordance with fluctuations in  
their demand, and eliminating the risk of constructing large scale  
plants responsible for individual hydrofluorocarbons.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L15 ANSWER 9 OF 11 USPATFULL on STN  
AN 1999:53725 USPATFULL  
TI Synthesis of difluoromethane  
IN Requieme, Benoit, Charly, France  
Lacroix, Eric, Amberieux D'Azergues, France  
Lantz, Andre, Vernaison, France  
PA Elf Atochem S.A., Paris La Defense, France (non-U.S. corporation)

PI US 5900514 19990504  
AI US 1996-663977 19960614 (8)  
PRAI FR 1995-7705 19950627  
DT Utility  
FS Granted  
EXNAM Primary Examiner: Geist, Gary; Assistant Examiner: Vollano, Jean F.  
LREP Bell, Bond & Lloyd  
CLMN Number of Claims: 10  
ECL Exemplary Claim: 1  
DRWN No Drawings  
LN.CNT 402  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
AB The invention relates to the manufacture of difluoromethane by catalytic gas-phase fluorination of methylene chloride.

The operation is carried out in the presence of oxygen at a temperature of between 330 and 450.degree. C. and with a bulk or supported chromium catalyst.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L15 ANSWER 10 OF 11 USPATFULL on STN  
AN 1998:157560 USPATFULL  
TI Method for producing difluoromethane and 1,1,1,2-tetrafluoroethane  
IN Homoto, Yukio, Osaka, Japan  
Tanaka, Kunitada, Osaka, Japan  
Shibanuma, Takashi, Osaka, Japan  
Komatsu, Satoshi, Osaka, Japan  
Koyama, Satoshi, Osaka, Japan  
PA Daikin Industries, Ltd., Osaka, Japan (non-U.S. corporation)  
PI US 5849963 19981215  
WO 9515937 19950615  
AI US 1996-656229 19960607 (8)  
WO 1994-JP2070 19941209  
19960607 PCT 371 date  
19960607 PCT 102(e) date  
PRAI JP 1993-309523 19931209  
DT Utility  
FS Granted  
EXNAM Primary Examiner: Rotman, Alan L.  
LREP Birch, Stewart, Kolasch & Birch, LLP  
CLMN Number of Claims: 14  
ECL Exemplary Claim: 1  
DRWN 6 Drawing Figure(s); 3 Drawing Page(s)  
LN.CNT 842  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
AB According to the method for producing difluoromethane and 1,1,1,2-tetrafluoroethane, having the steps of:

(1) reacting methylene chloride and 1,1,2-trichloroethylene with **hydrogen fluoride** in a vapor phase in the presence of a fluorinating **catalyst** and 1,1,1,2-tetrafluoroethane in a first reactor; and

(2) reacting 1,1,1-trifluorochloroethane with **hydrogen fluoride** in a vapor phase in the presence of a fluorinating **catalyst** in a second reactor, and supplying the reaction mixture from the second reactor to the first reactor, HFC-32 can be obtained in high conversion and high selectivity by fluorinating HCC-30 using commonly a large (excess) amount of HF which is required for producing HFC-134a.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L15 ANSWER 11 OF 11 USPATFULL on STN  
AN 1998:65485 USPATFULL  
TI Process for the production of difluoromethane  
IN Clemmer, Paul Gene, Williamsville, NY, United States  
Smith, Addison Miles, Amherst, NY, United States  
Tung, Hsueh Sung, Getzville, NY, United States  
Bass, John Stephen, East Amherst, NY, United States  
PA Allied Signal Inc., Morris township, Morris County, NJ, United States  
(U.S. corporation)  
PI US 5763708 19980609  
AI US 1995-530649 19950920 (8)  
DT Utility  
FS Granted  
EXNAM Primary Examiner: Dees, Jose G.; Assistant Examiner: Pryor, Alton  
LREP Gianneschi, Lois A.  
CLMN Number of Claims: 9  
ECL Exemplary Claim: 1  
DRWN No Drawings  
LN.CNT 346  
CAS INDEXING IS AVAILABLE FOR THIS PATENT.  
AB The present invention provides a vapor phase process for the production  
of difluoromethane, HFC-32. The process of this invention provides for  
the preparation of HFC-32 by a process that exhibits both good product  
yield and selectivity.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.